WHAT IS CLAIMED IS:

1. A tantalum billet having a substantially uniform grain size.

2. An extruded tantalum billet having a substantially uniform average grain size.

3. The extruded tantalum billet of claim 2, wherein said average grain size is about 150 microns or less.

4. The extruded tantalum billet of claim 2, wherein said average grain size is about 100 microns or less.

5. The extruded tantalum billet of claim 2, wherein said average grain size is about 50 microns or less.

6. The extruded tantalum billet of claim 2, wherein said average grain size is from about 25 microns to about 100 microns.

7. The extruded tantalum billet of claim 2, having a purity of at least about 99.995%.

8. The extruded tantalum billet of claim 2, wherein said tantalum billet is fully recrystallized.

9. The extruded tantalum billet of claim 2, wherein said tantalum billet is at least partially recrystallized.

10. The extruded tantalum billet of claim 2, wherein said tantalum billet is about 98% or more recrystallized.

11. The extruded tantalum billet of claim 2, wherein said tantalum billet is about 80% or more recrystallized.

12. The extruded tantalum billet of claim 2, having a purity of from about 99.995% to about 99.999%

13. The extruded tantalum billet of claim 2, further comprising at least one alloy material.

14. A sputtering target comprising the extruded tantalum billet of claim 2.

15. A capacitor can comprising the extruded tantalum billet of claim 2.

16. A resistive film layer comprising the extruded tantalum billet of claim 2.

17. An article comprising at least as a component the extruded tantalum billet of claim 2.

18. A process for making the extruded tantalum billet of claim 2 comprising extruding a tantalum ingot at a sufficient temperature and for a sufficient time to at least partially recrystallize the tantalum billet during extrusion.

19. The process of claim 18, wherein said sufficient temperature is from about 1200 °F to about 2950 °F.

20. The process of claim 18, wherein said temperature is uniform throughout the extrusion process.

21. The process of claim 18, further comprising the step of water quenching the extruded tantalum billet after extrusion.

22. The process of claim 18, further comprising machine cleaning the extruded tantalum billet.

23. A process for making the extruded tantalum billet of claim 2, comprising extruding a starting tantalum billet at a sufficient temperature and for a sufficient time to at least partially recrystallize the tantalum billet to form said extruded tantalum billet.

24. The process of claim 23, wherein said sufficient temperature is from about 1200 °F to about 2950 °F.

25. The process of claim 23, wherein said temperature is uniform throughout the extrusion process.

26. The process of claim 23, further comprising the step of water quenching the extruded tantalum billet after extrusion.

27. The process of claim 23, further comprising machine cleaning the extruded tantalum billet.

28. A process for making the extruded tantalum billet of claim 2, comprising cutting an ingot into at least one starting billet and either applying a protective coating on said starting billet or placing said starting billet in a can;

extruding the starting billet at a sufficient temperature and for a sufficient time to at least partially recrystallize the tantalum billet and to form said extruded tantalum billet.

29. The process of claim 28, wherein said sufficient temperature is from about 1200 °F to about 2950 °F.

30. The process of claim 28, wherein said temperature is uniform throughout the extrusion process.

31. The process of claim 28, further comprising the step of water quenching the extruded tantalum billet after extrusion.

32. The process of claim 28, further comprising machine cleaning the extruded tantalum billet.

33. The process of claim 28, wherein said ingot is obtained by the electron beam melting of a high purity tantalum powder feedstock.

34. The process of claim 28, wherein said protective coating or can is removed after said extruding.

35. The process of claim 34, wherein said protective coating is removed by acid washing or machine cleaning, or both.

36. A niobium billet having a substantially uniform grain size.

37. An extruded niobium billet having a substantially uniform average grain size.

38. The extruded niobium billet of claim 37, wherein said average grain size is about 150 microns or less.

39. The extruded niobium billet of claim 37, wherein said average grain size is about 100 microns or less.

40. The extruded niobium billet of claim 37, wherein said average grain size is about 50 microns or less.

41. The extruded niobium billet of claim 37, wherein said average grain size is from about 25 microns to about 100 microns.

42. The extruded niobium billet of claim 37, having a purity of at least about 99.995%.

43. The extruded niobium billet of claim 37, wherein said niobium billet is fully recrystallized.

44. The extruded niobium billet of claim 37, wherein said niobium billet is at least partially recrystallized.

45. The extruded niobium billet of claim 37, wherein said niobium billet is about 98% or more recrystallized.

46. The extruded niobium billet of claim 37, wherein said niobium billet is about 80% or more recrystallized.

47. The extruded niobium billet of claim 37, having a purity of from about 99.995% to about 99.999%

48. The extruded niobium billet of claim 37, further comprising at least one alloy material.

49. A sputtering target comprising the extruded niobium billet of claim 37.

50. A capacitor can comprising the extruded niobium billet of claim 37.

51. A resistive film layer comprising the extruded niobium billet of claim 37.

52. An article comprising at least as a component the extruded niobium billet of claim 37.

53. A process for making the extruded niobium billet of claim 37 comprising extruding a niobium ingot at a sufficient temperature and for a sufficient time to at least partially recrystallize the niobium billet during extrusion.

54. The process of claim 53, wherein said sufficient temperature is from about 1000 °F to about 2650 °F.

55. The process of claim 53, wherein said temperature is uniform throughout the extrusion process.

56. The process of claim 53, further comprising the step of water quenching the extruded niobium billet after extrusion.

57. The process of claim 53, further comprising machine cleaning the extruded niobium billet.

58. A process for making the extruded niobium billet of claim 37, comprising extruding a starting niobium billet at a sufficient temperature and for a sufficient time to at least partially recrystallize the niobium billet to form said extruded niobium billet.

59. The process of claim 58, wherein said sufficient temperature is from about 1000 °F to about 2650 °F.

60. The process of claim 58, wherein said temperature is uniform throughout the extrusion process.

61. The process of claim 58, further comprising the step of water quenching the extruded niobium billet after extrusion.

62. The process of claim 58, further comprising machine cleaning the extruded niobium billet.

63. A process for making the extruded niobium billet of claim 37, comprising cutting an ingot into at least one starting billet and either applying a protective coating on said starting billet or placing said starting billet in a can;

extruding the starting billet at a sufficient temperature and for a sufficient time to at least partially recrystallize the niobium billet and to form said extruded niobium billet.

64. The process of claim 63, wherein said sufficient temperature is from about 1000 °F to about 2650 °C.

65. The process of claim 63, wherein said temperature is uniform throughout the extrusion process.

66. The process of claim 63, further comprising the step of water quenching the extruded niobium billet after extrusion.

67. The process of claim 63, further comprising machine cleaning the extruded niobium billet.

68. The process of claim 63, wherein said ingot is obtained by the electron beam melting of a high purity niobium powder feedstock.

69. The process of claim 63, wherein said protective coating or can is removed after said extruding.

70. The process of claim 69, wherein said protective coating is removed by acid washing or machine cleaning, or both.

71. The process of claim 18, further comprising annealing said extruded tantalum billet.

72. The process of claim 71, wherein said annealing occurs at a temperature and for a time sufficient to at least partially recrystallize the extruded tantalum billet during annealing.

73. The process of claim 71, wherein said annealing occurs at a temperature of from about 950°C to about 1150°C for about 2 hours.

74. The process of claim 23, further comprising annealing said extruded tantalum billet.

75. The process of claim 74, wherein said annealing occurs at a temperature and for a time sufficient to at least partially recrystallize the extruded tantalum billet during annealing.

76. The process of claim 74, wherein said annealing occurs at a temperature of from about 950°C to about 1150°C for about 2 hours.

77. The process of claim 28, further comprising annealing said extruded tantalum billet.

78. The process of claim 77, wherein said annealing occurs at a temperature and for a time sufficient to at least partially recrystallize the extruded tantalum billet during annealing.

79. The process of claim 77, wherein said annealing occurs at a temperature of from about 950°C to about 1150°C for about 2 hours.

80. The process of claim 53, further comprising annealing said extruded niobium billet.

81. The process of claim 80, wherein said annealing occurs at a temperature and for a time sufficient to at least partially recrystallize the extruded niobium billet during annealing.

82. The process of claim 80, wherein said annealing occurs at a temperature of from about 950°C to about 1150°C for about 2 hours.

83. The process of claim 58, further comprising annealing said extruded niobium billet.

84. The process of claim 83, wherein said annealing occurs at a temperature and for a time sufficient to at least partially recrystallize the extruded niobium billet during annealing.

85. The process of claim 83, wherein said annealing occurs at a temperature of from about 950°C to about 1150°C for about 2 hours.

86. The process of claim 63, further comprising annealing said extruded niobium billet.

87. The process of claim 86, wherein said annealing occurs at a temperature and for a time sufficient to at least partially recrystallize the extruded niobium billet during annealing.

88. The process of claim 86, wherein said annealing occurs at a temperature of from about 950°C to about 1150°C for about 2 hours.

89. A process for making the extruded tantalum billet of claim 2, comprising extruding a tantalum ingot to form an extruded tantalum billet and then annealing said extruded tantalum billet at a sufficient temperature and for a sufficient time to at least partially recrystallize the extruded tantalum billet.

90. A process for making the extruded tantalum billet of claim 2, comprising extruding a starting tantalum billet to form said extruded tantalum billet and then annealing said extruded tantalum billet for a sufficient time and for a sufficient temperature to at least partially recrystallize the extruded tantalum billet.

91. A process for making the extruded tantalum billet of claim 2, comprising cutting an ingot into at least one starting billet and either applying a protective coating on said starting billet or placing said starting billet in a can;

extruding the starting billet to form said extruded tantalum billet and then annealing said extruded tantalum billet at a sufficient temperature and for a sufficient time to at least partially recrystallize the extruded tantalum billet.

92. A process for making the extruded niobium billet of claim 37, comprising extruding a niobium ingot to form an extruded niobium billet and then annealing said extruded niobium billet at a sufficient temperature and for a sufficient time to at least partially recrystallize the extruded niobium billet.

93. A process for making the extruded niobium billet of claim 37, comprising extruding a starting niobium billet to form said extruded niobium billet and then annealing said extruded niobium billet for a sufficient time and for a sufficient temperature to at least partially recrystallize the extruded niobium billet.

94. A process for making the extruded niobium billet of claim 37, comprising cutting an ingot into at least one starting billet and either applying a protective coating on said starting billet or placing said starting billet in a can;

extruding the starting billet to form said extruded niobium billet and then annealing said extruded niobium billet at a sufficient temperature and for a sufficient time to at least partially recrystallize the extruded niobium billet.